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SKETCH OF THE PROPOSED LINE
OF
OVERLAND RAILROAD
THROUGH
BRITISH NORTH AMERICA.

BY
ALFRED WADDINGTON.

"WHERE THERE IS A WILL THERE IS A WAY."

LONDON:
LONGMANS, GREEN, READER, AND DYER.

1869.

Price One Shilling.

*To H. J. Morgan Esq.^{re}
with the Author's Compliments*

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P R E F A C E .

IN my pamphlet of September last, on a proposed "Overland Route through British North America," I merely showed the general practicability of such a route, without entering into details which would have been tiresome to the general reader. The pamphlet has had a wider circulation than I expected; and as doubts have been raised on several points, more especially as regards the direct line of railroad to the north of Lake Superior, my friends have urged me to answer them. This I cannot do better than by the following more detailed description of the road, which will serve as a supplement to the pamphlet. With the few elements at my disposal, such an abridged sketch must necessarily be very imperfect, if not occasionally incorrect; but it is the first attempt yet published, and as such will, I trust, be found useful by those who take an interest in this grand scheme, and their number is daily increasing.

The discovery of a practicable route through the mountains of British Columbia was naturally the first step towards opening an Overland communication. I have already explained how that difficulty was overcome; and now that the Hudson's Bay Company have accepted the proposal made to them by Lord Granville for the surrender of the North-West territory, another obstacle, hitherto considered as next to insurmountable, has also been removed. The speedy accomplishment of this important measure, owing chiefly to the untiring efforts of the Canadian delegates and the good sense and energy of Lord Granville, can but encourage the writer to fresh perseverance in his efforts. The difficulties still to be grappled with are great, it is true, but the worst, it is believed, have now been surmounted. The future of the Dominion, the development of its great resources, and the consolidation of its power depend on the opening up of a communication between Canada and the Pacific through the Red River settlement and the Fertile Belt. These will therefore now be quickly thrown open; the general confederation of British North America will naturally follow; and the lately so-called

impossible project of an Overland Railroad (which, when accomplished, will make Canada the emporium of the trade of Europe with China and Japan) may be looked upon ere long as a simple question of pounds, shillings, and pence. I am aware that the sum required (thirty-two millions, including interest till the road becomes self-paying) appears at first sight something enormous; but the applications to Parliament this session for Bills relating to railroads in the United Kingdom alone (where any new line of railroad seems almost impossible) amount to more than sixteen millions, or over half that sum, with the chance of much smaller returns. With the enlightened assistance of the Canadian Government by liberal grants of land, and a properly guarded system of guarantee, by means of which the credit of the Dominion might in the first instance be made available—especially if indorsed by the Home Government; subscription lists to the above amount could be easily covered. The Government guarantees in India amounted, April 1st, 1867, to a much larger sum, £67,254,802, and they have been a complete success, as everybody in financial circles is aware of. Besides, by providing for the payment of the interest, the above guarantee would be rendered almost nominal.*

The Central Pacific railroad across the American Continent has just been opened. Its professed purpose is to transfer the trade of the Old to the New World (see Appendix D); and when the commercial fate of England is trembling in the balance, the urgent necessity of a rival route of our own, independent of foreign regulations or tariffs, can no longer be disguised, or the question lightly postponed. What the writer has so long been striving to forward will soon become the question of the day; and if, as some pretend, Englishmen can only act vigorously when fairly aroused, that day may not be far distant—when we shall set to work in good earnest to carry out this truly great and national undertaking and make up for lost time.

ALFRED WADDINGTON.

*Tavistock Hotel, Covent Garden,
May 25th, 1869.*

* For further details as to the probable traffic and returns of the proposed railroad, see "Overland Route through British North America," by the writer. Longmans and Co., Paternoster Row, 1868. Price One Shilling, with Coloured Map.

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SKETCH OF THE PROPOSED LINE OF OVERLAND RAILROAD

THROUGH

BRITISH NORTH AMERICA,

*From Ottawa to Fort Garry, and thence to the Yellow Head Pass and
Bute Inlet.*

"WHERE THERE IS A WILL THERE IS A WAY."

OTTAWA TO FORT GARRY.

MILES.

** It is
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to start
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Mattawan
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above
the sea*

A LINE of railroad from Ottawa to Fort Garry must necessarily be drawn so as to avoid the mountainous region extending from 20 to 30 miles north of Lake Superior, which is altogether unsuitable for a railroad; and as the valley of the Ottawa offers a nearly straight line and every facility for this purpose, it will naturally be the one followed. * Starting therefore from Ottawa, the road would run by Arnprior, on the Madawaska, to Sandpoint, the present terminus of the Brockville and Ottawa railway, 6 or 7 miles beyond; and then, crossing Bonnechere river, to Pembroke, the proposed future terminus, some 40 miles further on and 100 miles from Ottawa. A little above Pembroke the road would cross Indian river, and 10 miles further on the Petowawa, rather a large stream. The ground, however along the Ottawa from Pembroke to the Mattawan river, though favourable, is generally poor; and better land for settlement would be traversed, without any great inconvenience, by taking the line more to the west. At the Mattawan the best ground both for the road and for settlement would be found by passing near the head of that river. From this point it would run in a direct line for 85 miles (in the course of which it would cross several small tributaries) to the mouth of the Montreal river, where the latter falls into Temiscaming Lake, an expansion of the Ottawa, in long. 79° 30', lat. 47° 07'. Total distance from Ottawa through a country well-known and presenting no serious obstacle.

285

** North
side of
the*

From the mouth of the Montreal, the line would run north-westwardly along the Montreal valley, by a direct and very favourable course, and over a flat country mostly suitable for settlement, to the northern angle or elbow of that river, which it would cross in lat. 48° Distance

99

Here the road would pass the watershed of the Lawrentides at

Miles ... 384

Over ... 384

the low level of about 830 feet above the sea, and enter on the level clay country, that extends north of the tributaries of the Ottawa, which rise in the Lawrentian formation, to Hudson's Bay; and for several hundred miles west, to the Lawrentian height of land between Lake Superior and Lake Winnipeg. This vast extent of entirely arable land, of a clayey, stubborn nature, but found to be capable of improvement and productive, since wheat is successfully grown at New Brunswick House, in lat. $49^{\circ} 08'$, 45 miles north of the proposed line, whilst the line of limit to wheat cultivation runs still further north, offers a more favourable line for the construction of a railroad, and at the same time a country more fit for settlement, than that to the south, which lies in the Lawrentian formation, and is generally poor, sandy and rocky. The road would therefore now be carried a little to the north of the direct line, through this clay country, which it would traverse for nearly 250 miles.

Beginning with a W.N.W. course along its southern limit, and crossing the Waratowaba or south branch of the Abbitibi at the end of about 20 miles, it would reach long. 83° near the head of Carp Lake on the south branch of Moose River; 90 miles north of its source, whence it flows towards Hudson's Bay, and about 60 miles north of the termination of the line surveyed by D. Sinclair in 1867. Distance with the sinuosities*

From Carp Lake the road would continue W.N.W. through a country comparatively low, to the north-end of Minisabe Lake, (long. $83^{\circ} 50'$) on Moose River,† and thence, passing some 12 miles to the south of Cross Lake, to the 85^{th} meridian, a little north of 49° lat.; whence the road would run nearly due west to 86° long. The absence of further details must be attributed to the little knowledge we have of the country through which this portion of the line would pass. Total distance, allowing for sinuosities

The road will now have re-entered the basin of the St. Lawrence, (the country becoming more difficult and undulating) and continuing a due west course for about 12 miles, cross first a branch of the Pie River, and then the river itself flowing through a rich valley from 1 to 3 miles wide towards Lake Superior

From this point the road would run for the next 80 miles, with an average elevation of 200 feet or more above Lake Superior, along the hilly undulations forming the northern slope of the mountains which border the Lake, and which extend here from 20 to 30 miles north of it.

Between Pie River and the foot of Long Lake in long. $87^{\circ} 04'$, it would cross at the end of 14 miles the valley of the Little Pie about 2 miles wide, and composed of rich, clayey soil, which extends round

Miles ... 663

* Most of the foregoing details are taken from Al. Russell's valuable work on the Hudson's Bay Territories.

† The latitudes and longitudes must here be considered as approximate.

All this has been fully confirmed by Mr. Safford's late exploratory trip.

Over ... 663

White Fish Lake, a tributary further on. Passing to the north of this lake, it would then cross at the end of 16 miles a small stream, called Steel river, the whole of the intervening country, with the above exceptions, being rugged and swampy. Long Lake is from one to three miles wide, and stretches 90 miles north. It forms a branch of the Albany, which flows into Hudson's Bay, and takes its rise in Owl Lake, only six miles from Lake Superior. The road would cross this stream at the foot of the lake, 22 miles N. of Lake Superior. Distance from Pie river

36

The line would now run 18° N. of W. for 25 miles to the north end of Wintering Lake, on Pays Plat river, and thence 15° N. of W. to the 88th W. long., lat. $49^{\circ} 15'$; the whole over rocky, undulating ground, but with some intervening valleys of good soil. In the course of this distance it would cross the Black, Pays plat, Gravel, and Cypress rivers, all rapid and inconsiderable streams falling into Lake Superior. Distance

43

Here the road again changes direction, and forming an obtuse angle, would turn some 15° S. of W., and enter on good, level, low land; crossing a small stream called the Jackfish at the end of 8 miles, and avoiding a range of granite and trap-rock hills, 800 to 1,000 feet high to the north, between the proposed line and Lake Neepigon. It would then continue through a level tract of good loamy soil for about 17 miles more to the Neepigon. This is the largest river on the north shore of Lake Superior, to which it flows through the range of mountains bordering the Lake; and which are here chiefly composed of amygdaloid rocks and porphyry, containing valuable copper ore in many places. Distance

25

Neepigon river would be crossed about 25 miles below the lake of that name, at an elevation probably of not more than 100 feet above Lake Superior, itself 600 feet above the sea. From this point a branch line to Neepigon Bay would put the railroad in direct communication with Lake Superior. The distance along the western side of the Neepigon valley, composed of excellent soil, would be 17 miles; 4 of which at the mouth of the river form a wide and deep channel, leaving only 13 miles of road to be constructed. Apart from the very important accession of traffic, which this would procure to the projected line, the advantages of such a communication in a public point of view (uniting, as it would, the great steamboat routes of Lake Superior and the Saskatchewan with Ottawa uninterruptedly all the year round) are self-evident, and very superior to those of any proposed line from Thunder Bay; which would not only be isolated during the winter, but in order to avoid the Lake of the Woods, must either pass through American territory, or after coming within 25 miles of the proposed Overland route at Jourdain's rapid, have to make a detour of 100 miles or more to the north, from somewhere near Rainy Lake, in order, after all, to fall into it north of Whitefish Bay. A railway subject to such disadvantages would

Prof. Bull finds that this branch could be avoided, and the road brought within three or four miles of Lake Superior.

Miles ... 767

Over ... 767

be of little or no use, and quite unavailable as a link in the great Overland communication with the West.

From Neepigon river the road would run a little S. of W. over a good tract of land to Black Sturgeon river, lying in a valley composed of excellent soil, and about six miles wide. Here it would turn W.N.W., passing through a depression between granite hills 1,000 feet high, to the Little Sturgeon, a branch of the former, and 4 miles distant. Both of these streams are fed by Lake Neepigon, 400 feet above Lake Superior, and stretching 90 miles north, by 65 wide. Distance

16

So far the whole line of country traversed after leaving Ottawa is relatively low, and the variations of level unimportant; but the road has now to cross the height of land which separates Lake Superior from Lake Winnipeg. Of this, again, little is known, excepting that the rocks are chiefly granite and gneiss, forming rounded summits or oblong eminences of little altitude, but transverse to the course of the road, and separated by inclined narrow valleys, or larger ones occupied by deep lakes; that the country to be traversed is generally lower and more even than towards the South; and that it is in many places heavily timbered.

Proceeding from the crossing of the Little Sturgeon some 15° N. of W., the soil continues for about four miles to consist of a productive loam. The road would then begin to rise (near long. 89°) along the side of the valley, the surface soil overlying a soft red steatitic rock. Then, passing over a tract of rolling, rich, clayey soil, it would follow a straight line towards the S.E. corner of Sturgeon Lake, in long. 91°, lat. 49° 30', until it reached the head of a small lake on a western feeder of Lake Neepigon, which takes its rise near the watershed, some 25 miles further south-west. Distance

45

The road would then run in a westerly direction, following up this feeder, which it would cross, and afterwards a small affluent, so about 5 miles beyond the 90° W. long., where it would reach the divide, or watershed. Distance

22

The height of land here would probably be somewhat less than at Jourdain's portage on the Savanne river (1,493 feet above the sea), since the above feeder heads some 15 miles S.W. of this point, at a short distance from the stream which runs south towards Jourdain's rapid, and which is not much longer; whilst the country northward is known, as before said, to be generally lower. Assuming the height to be 1,400 feet, and the distance from the foot of the ascent to be 60 miles, the rise would be about 650 feet, or less than 11 feet to the mile.

The road would now cross over to and follow an affluent running from the E.S.E. to the southernmost point of Sturgeon Lake. Distance

40

It would then follow the south-western shore of this lake for 15 miles.

15

Miles ... 905

Over ... 905

Continuing a little N. of W., it would cross from Sturgeon Lake to a bend in Canoe River, an affluent of Lac Seul, distant 35 miles, on the Canoe route from Fort Frances, and, crossing it, follow it down to the S.E. corner of the Lake, some 12 miles. In all

47

From Lac Seul the ground is generally considered to be lower, and though rough, and embarrassed with numerous lakes, to present no important obstacle. The road would run along the southern shore of this lake for 11 miles, and then crossing an affluent called Whitefish river, run up the valley a little S. of W. for 18 miles, following the north shore of a lake at the head of it, and then a straight line slightly N. of W. (in all about 57 miles) to the north end of White Fish Bay, 978 feet above the sea. Total distance

86

Crossing an affluent from the North, the road would follow the north-western side of this bay for some distance, and then strike nearly due-west over a broken sterile tract of country to the Winnipeg. This river, which is of large volume, about equal to the Rhine, would be crossed at the "Dalles," 958 feet above the sea. Distance

48

From the Dalles the road would pass a little N. of W. over easier ground to the foot of Falcon Lake on Labarrière river.

24

It would then run in a straight line due west to Fort Garry passing a little to the south of the Fork of White Mouth river. About 5 miles beyond this, or 38 miles from Labarrière river, the road would leave the Lawrentides and enter on the Silurian formation, which extends to Fort Garry, and forms here the beginning of the great plain which stretches westward as far as the Rocky Mountains. It would now run over unusually level and favourable ground for 52 miles; passing over several small branches of the Broken Head, a small rivulet called German Creek, and, finally, across Red river, (100 to 150 yards wide) to Fort Garry, a little below the confluence of the Assiniboine, Distance in all,

90

Total distance from Ottawa ... Miles 1290

PLAIN OF THE SASKATCHEWAN.

The railroad, as before said, will now have entered on the Great Plain, which further west takes the name of the Saskatchewan; passing through Fort Garry and the Fertile Belt in its whole length, to the foot of the Leather or Yellow Head Pass (lat. $53^{\circ} 12'$) in the Rocky Mountains. This plain rises in successive benches, gradually but almost imperceptibly, from Fort Garry (647 feet above the sea) to the foot of the Rocky Mountains, where it attains a height of over 3,000 feet; notwithstanding which, wheat is successfully grown at Fort Edmonton in lat. $53^{\circ} 32'$, 2,728 feet above the sea. It presents the easiest ground in the world for the construction of a

railway, and, therefore, only requires a general indication of the line the proposed road would follow.

Starting from Fort Garry, this would be through the Red River Settlement; first nearly due west for 6 miles along the north side of the Assiniboine to Sturgeon Creek; then slightly N. of W. for 5 miles, and afterwards N.W. over another small creek to Lane's Post, 10 miles, and to Long Lake 8 miles beyond; the whole over level, open, and beautiful prairie ground. From Long Lake the road would follow the Assiniboine in a south-westerly direction for 26 miles more, to the village at "Prairie Portage," forming the western boundary of the settlement, in long. $98^{\circ} 30'$, lat. 50° N. The whole of this portion of road from Fort Garry lies in the Devonian formation. Total distance

55

A straight line from Prairie Portage (or possibly from Long Lake 26 miles back) to the foot of the Yellow Head Pass, a few miles N. of Jasper's House, would carry the road along the border of the more arid and treeless plains towards the south, instead of passing through the "true prairie land" called the Fertile Belt. In order to do this, the road would have to follow a west-north-westerly course (which would not lengthen it materially) to the mouth of a small tributary of Rapid river, at the foot of the Riding Mountains, in long. $99^{\circ} 45'$, lat. $50^{\circ} 30'$; and thence run a degree or two more to the north in a straight line to the North Saskatchewan, some 18 miles above the Bend, and near the confluence of a small affluent from the Eagle Hills, in long. $107^{\circ} 15'$. The railroad would thus connect with that noble stream near the middle of its course, and consequently with the vast tracts of country which it traverses, both above and below; at the same time that it would open up the very richest ground on this side the Assiniboine, and run nearly the whole way through the Fertile Belt beyond.

Following this line from Prairie Portage, the road would cross at the end of 5 miles a small stream, called Rat river, running north to Lake Manitouba. It would then run W.N.W. along the valley of White Mud river, through a country of prairie lands of the richest description, thickly interspersed with woods, to a tributary in long. $98^{\circ} 40'$, where the valley takes a more westerly direction; and crossing the river, continue due west over several insignificant streams from the southern foot of the Riding Mountains, to the N.E. elbow of Rapid river in long. $99^{\circ} 30'$; a stream about 50 feet wide, which here turns abruptly to the S.W. A little before reaching this, the road will have left the Devonian and entered on the Cretaceous formation which (more or less covered with superficial deposits) extends to the foot of the Rocky Mountains. Crossing Rapid river near the Bend, the road would then follow the south side of the valley for about 12 miles to the tributary in long. $99^{\circ} 45'$, where the line changes direction. Distance from Prairie Portage

80

Turning very slightly northward, the road would continue to

Miles ... 135

Over ... 135

follow the rich fertile valley of Rapid river in a line nearly parallel to the Riding Mountains, for about 30 miles more, and then cross the head of Oak river, 10 miles further on. After this, it would cross consecutively two branches of Arrow river, and the sources of Pine Creek, Bird Tail Creek, and another; all rising in the Riding Mountains (about 1,000 feet above the plain), to the north-east. It would then cross Shell river, flowing from a valley further north, and distant about 40 miles from Oak river; then another affluent of the Assiniboine, and finally cross the latter in lat. 51° , half way between Fort Ellice and Fort Pelly. Total distance, through a country composed of a rich, sandy loam, sinuosities included,

110

The Assiniboine flows here in a valley about a mile wide, 150 feet below the plain. Leaving the valley, the road would enter on a rich, park-like country, similar to that previously traversed, interspersed with small lakes, and partially wooded; and crossing the head of a tributary of Calling river, reach at the end of about 40 miles a small stream flowing to the north, called Little White Sand river; 3 or 4 miles to the north of Leech Lake on the Big Cut Arm, which runs south. The road would then continue for about 38 miles more to the S.E. foot of the Little Touchwood Hills. Total distance, allowing for sinuosities,

85

The tract of country embraced by the Little and the Great Touchwood Hills, which are about 20 miles apart, is of the best quality, rich, fertile, and well wooded; coal is also said to be found in abundance. The road would pass over the first 34 miles to a point 8 miles north of the deserted Fort, at the S.W. foot of the Great Touchwood Hills, in lat. $51^{\circ} 33'$, long. $104^{\circ} 20'$, and thence cross to their north-west side, about 16 miles distant, where a tributary at the foot of Heart Hill runs S.W. towards Last Mountain Lake on Calling river. In all

50

The road now enters again on the plain, composed here in some places of a lighter soil; and crossing at the end of twenty miles a second tributary to Last Mountain Lake, would re-enter the "true prairie land" near the S.W. end of a lake in long. $106^{\circ} 03'$, lat. $51^{\circ} 58'$. Distance

78

Thence it would continue for about 22 miles to the South Saskatchewan, 180 to 200 yards wide, and 10 to 14 feet deep, flowing in a deep-cut valley, the sides of which are steep and wooded, 230 feet below the plain. This it would cross in lat. $52^{\circ} 08'$, some 35 miles below the Moose Woods and the Half-breed settlement there, and proceed over rather poor soil to the North Branch, at the confluence of Eagle Hill Creek, a distance of about 35 miles. In all

57

The road might now follow a direct line to Fort Edmonton, so as to join the beaten track by the settlements of St. Alban and St. Ann, to the Yellow Head Pass and Jasper's House. But this would take it 50 miles to the north of the straight line, besides passing through a very marshy country; and that without any adequate compensation;

Miles ... 515

Over ... 515

the more so as a branch line to Edmonton, if found desirable, would only be 35 miles long. A straight line from the north of the Eagle Hills to near Jasper's House would therefore be far preferable.

Following this direction, the road would run for the first 20 miles or more between the foot of the Eagle Hills and the Saskatchewan; and then in a straight line W.N.W. to the south bank of Battle river, near Ear Hill Creek in long. $108^{\circ} 33'$. Crossing the creek, it would follow it a little S. of W., and then run for 30 miles along the south side of "The Chain of Lakes" to the end of Manito Lake, and along two smaller ones beyond; then south of Eyebrow Hill, where it would cross Eye Hill Creek in long. $109^{\circ} 42'$, and the foot of a lake on Nose Creek, in long. $110^{\circ} 05'$, a stream flowing north from the Neutral Hills. Twelve or fifteen miles further west it would reach Battle river again, and after following the south bank for 6 or 7 miles over a broken country, partially wooded, cross it in long. $110^{\circ} 40'$, lat. $52^{\circ} 45'$. The road would now run north of the Dried Meat Hills, through a country rich, fertile, and clothed with luxuriant vegetation, to Long Lake Creek, a tributary of Battle river, which it would cross in long. $112^{\circ} 50'$, lat. $52^{\circ} 57'$. It would then run north of Beard Hill and across Smoking Wood Creek in long. $113^{\circ} 37'$; north of the Woodpecker Hills, across Pigeon Lake Creek, and for several miles along the south side of this lake, where there is a Wesleyan Mission; the whole through a country of the richest description. Thence the road would strike to the south end of Bull Lake; on leaving which it would enter the line of "true forests" in long. $114^{\circ} 05'$, and pass through them for about 30 miles, to the North Saskatchewan. This it would cross about lat. $53^{\circ} 08'$, long. $114^{\circ} 50'$, a little below the rapids, 3,048 feet above the sea, and near its bend towards the east, about 6 miles below the mouth of Brazeau river; from which point downwards it is believed to be navigable for steamers. Total length from Eagle Hill Creek, allowing for sinuosities,

350

The road would then run due west over easy ground, but covered with dense pine forests, and cross the Pembina at the end of about 80 miles, and the McCleod 40 miles further on; two clear, shallow streams from the south, flowing over pebbly beds, about 80 feet below the plain. From the McLeod to the entrance of the Pass at the foot of the Rocky Mountains, a few miles north of the Roche à Miette, the country for the last 25 miles becomes gradually more and more rolling and hilly. Distance, allowing for sinuosities,

145

Total distance from Fort Garry	...	...	Miles 1,010
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ROCKY MOUNTAINS.

The road now enters the Rocky Mountains, and turning south, passes for several miles between a small lake to the east, and the

Athabasca, a stream 200 yards wide, swollen and turbid with glacier water, which rises in the Rocky Mountains, some 90 miles above, and runs here nearly due north at the bottom of a wide, flat valley. A little higher up, the river expands into two small lakes, the lower one bathing the foot of a perpendicular limestone (?) bluff forming part of the Roche à Miette, a singular shaped mountain, 6,000 feet high from its base, or 9,400 feet above the sea. This bluff would require a cutting of a quarter of a mile or more in length. Immediately beyond, the road enters on a little sandy plain; opposite which, and in a lovely expanse extending some 5 miles on the left bank of the river, between the two lakes, lies Jasper's House, in long. $118^{\circ} 10'$, lat. $53^{\circ} 12'$, 3,372 feet above the sea. The road now crosses several fordable mouths of a stream from the south, and continues in a southerly direction for about 18 miles up the narrowing valley, along the right bank of the Athabasca, and over easy ground, requiring at most an occasional cutting or embankment. At this point it would probably cross the river, hardly as wide here as the Thames at Westminster Bridge, deep and tranquil; thus avoiding the "Maligne," a large tributary which enters the Athabasca lower down from the opposite side. The road would then follow a sparsely timbered flat on the left bank, for 7 or 8 miles, up to a small prairie, the site of an old lodge, called Henry's House; when the track leaves the valley of the Athabasca, and the Pass properly speaking begins. Total distance

Turning abruptly to the W.N.W. (which direction the road will now follow with little variation for the next 55 miles, as far as the west end of Moose Lake) it would enter the rocky valley of the Miette, a deep, tortuous, rapid stream, 30 yards wide. The road would follow this valley for about 12 miles; and then crossing a small tributary called the Pipestone, pass over easy ground, rising gradually and imperceptibly, till it reached the summit of the Pass, 3,760 feet above the sea. The twistings of the Miette would require several bridges, or else considerable side cuttings, in order to avoid the stream; these, however, it is believed, would seldom reach the rock. After leaving the Miette the mountains diverge, and the valley opens. Distance from Henry's House

			22
Miles	...	...	52

BRITISH COLUMBIA.

The summit of the Yellow Head Pass forms the limit of British Columbia. It presents a comparatively open and level space for about 3 miles; after traversing which, the road would pass over easy ground along the north-side of Cowdung Lake, and at the foot of verdant, swelling hills; the lake consisting of two portions connected by a short narrow channel, and all in about 7 miles long. It would then follow the direction of the small stream issuing from the western

extremity of the lake for several miles, down to where the Fraser, flowing through a narrow gorge from the south-west, sweeps round into the valley. The road would run for the next 4 or 5 miles along the north side of this stream, between the river and the steep hill sides of the straitened valley, over level but low ground, subject to be overflowed and encumbered with fallen timber; till it reached Moose river, a rapid stream falling in from the north. Two or 3 miles below, the Fraser expands into Moose Lake, 12 to 15 miles long by 2 to 3 wide. The mountains on the south side of this lake rise perpendicularly to a height of 2,000 feet. On the north-side, though less abrupt, they still come down in many places to the water's edge, and close in on the road, thus necessitating several miles of side cutting along the lake. The valley now begins to acquire a more rapid and continuous descent, and changing direction runs nearly due west for the next 30 miles. Four or five miles below Moose Lake, it opens somewhat, after which it is much encumbered by large timber, till the mountains close in once more, and the road between them and the Fraser is obstructed by lofty cliffs of crumbling slate rock, the first met with beyond the Summit. A side-cutting of about 200 yards would be necessary at this point, besides several other smaller ones lower down, where the mountains shut in the valley very closely. Four or five miles below this, or about 15 miles from Moose Lake, a considerable branch called the "Grand Fork" enters the Fraser at right angles from the north, through five separate mouths, which would have to be crossed. At this point the Fraser runs through a narrow rocky gorge; after which the valley, for the next 10 miles to opposite the Indian camp at the "Cache," becomes much more open, and the ground easier, though intersected by several streams from the north, and obstructed by fallen timber of great size. Total distance from the Summit to the Cache

58

The latter half of this distance is heavily timbered, and the descent between Moose Lake and the Cache rapid and continuous, but nowhere steep; averaging less than 45 feet to the mile, and probably never exceeding 70. There would also be some considerable side cuttings and embankments, but not a single tunnel in the whole length of the Pass.

The continuation of the road in a straight line to the Pacific is now interrupted by a barrier of mountains, beginning some 5 miles below the Cache, and running north and south. These present the most extraordinary accumulation of mountains behind mountains, as far as the eye can reach; whilst they arrest the course of the Fraser, which turns suddenly north. The possibility of carrying a road or telegraph over them in a straight line from the Cache to William's Creek, one of the principal centres of the Cariboo gold mines, about 80 miles distant and in nearly the same latitude, has been tested by two distinct lines of exploration. These were run from Richfield; the one diverging

Miles 58

Over ... 58

slightly towards the south, and following Swamp river up to its source, 5,828 feet above the sea, near which the Shouswap, the North Thompson, and the Canoe rivers also take their rise; the other northward towards the "Grande Rapide" on the Fraser, a few miles below the Cache. The result was, that the road would not only pass over the point of greatest elevation, whence the above rivers flow north and south; but that it would have to cross three indescribably rugged mountain ridges, running perpendicular to the axis of the line, and separated by the narrowest valleys; one of them 6,444 feet above the sea, and all subject to continual avalanches. Features much the same as those accompanying Howse Pass to the south, and presenting an accumulation of obstacles which render any such line utterly impracticable.

The proposed railroad must therefore necessarily follow the valley of the Fraser to the north; or else take the line travelled by Milton and Cheadle down the Thompson to the south. At the latter, besides continuing for 120 miles below the Cache to run through a mountainous, uninhabitable region, covered with dense forests, and being costly in proportion, would lead to nothing definite beyond the opening up of a small portion of the Colony; since, in spite of every effort, no available line for a railroad between Fort Kamloops and New Westminster has as yet been discovered through the Cascade or Coast range.

The road down the valley of the Fraser, on the contrary, though describing a circuitous route, would *turn* the Cariboo or Gold Mountains, and communicate immediately, either below Westroad river, or lower down at Quesnel-Mouth, with the Chilcoaten or Great Western plain of the Colony; whilst below the mouth of Bear river, the valley opens upon a fine tract of rolling country, with a climate considerably milder than that of Canada, and ready for immediate settlement; instead of the interminable mountains and forests on the Thompson route. The Fraser, moreover, (whatever may have been said or written to the contrary,) offers a valuable water communication, and one immediately available, through the whole of this cultivable district. This route, it is true, would require several considerable bridges; over the North Fork, the Salmon, the Stuart and Westroad rivers on the north-side; or over Bear river, and twice over the Fraser, if carried along the south bank, besides some considerable gradings and cuttings; but it would nowhere present any very serious obstacle.

Following up this line, the road would run nearly due west for the first five miles below the Cache, over easy, open ground along the right bank of the Frazer, which then turns nearly due north. Several miles below this, it would cross an important affluent from the east, called "Rock Creek," and reach the "Rapide des Four-neaux." In all about 10 miles.

The river here takes a north-westerly direction. But in order to

10

Miles ... 68

Over ... 68

be able to continue a further description, it would be necessary to have a more complete survey of the valley, as regards the streams to be crossed, and the principal impediments on either side of the river; so as to know positively which bank the road should follow down to Fort George, and thence to Quesnel-Mouth. The distance from the "Rapide de Fourneaux" to the former place in lat. $53^{\circ} 55'$ long. $122^{\circ} 40'$, is 187 miles.

187

From Fort George the road would run south along the valley of the Fraser to Quesnel-Mouth, a small rising town on the road to the gold mines. Distance, sinuosities included,

93

From this place, or the opposite bank, it would then cross the rich Chilcoaten plain in a south-westerly direction, and nearly in its greatest breadth; crossing Deserter's river, and passing by William's Lake, to Chisicut Lake, on the Chiscoe or Chilcoaten, a small river, from 12 to 15 yards wide; then by Benchee Lake, in long. $124^{\circ} 05'$, lat. $52^{\circ} 13'$; across a small tributary of the Chilcoaten called the "Chilanco," 8 to 10 yards wide, and along the west side of Tatla Lake, 19 miles long, to the "Gap," or head of the Bute Inlet valley, (long. $124^{\circ} 30'$, lat. $51^{\circ} 47'$) at the entrance of the Cascade Mountains or Coast range. This slightly rolling, fertile plain offers every facility for a railway. Distance across it $137\frac{1}{2}$ miles. Thence the road would run down the valley, for $84\frac{1}{2}$ miles, to Waddington Harbour at the head of the Inlet. Near the entrance of this valley, a granite bluff on the uppermost lake, called Bluff Lake, would require some blasting. Below this, the road would run over level ground for nearly 40 miles, the valley presenting no kind of difficulty, till the mountains begin to close in; requiring in the next 8 miles a short tunnel, and considerable blasting in several places. The road would then reach the defile, or canyon, 31 miles above the head of the Inlet. This defile is exactly $1\frac{1}{4}$ mile in length, and would require two tunnels of 250 and 665 yards respectively, both in the granite; besides considerable blasting. Below the defile the valley opens again, and continues perfectly level down to the Inlet; the only difficulty being at the crossing of the Homathco, a considerable stream, a mile below the defile, which would require a bridge 60 to 70 yards long. With the exception of the above obstacles, which would be expensive, the whole line, from Quesnel-Mouth to Bute Inlet, may be said to offer one continuous level, and to be unusually favourable. It has been carefully surveyed, a map constructed containing the features of the ground, the curves, and other necessary details, to a scale of 4 inches to the mile, the outlay carefully calculated, and the whole revised and approved by competent engineers. Distance from Quesnel-Mouth to Waddington Harbour

222

Distance by this line ... Miles 570

The above road is the only one to the Pacific, through the mountains of British Columbia, which years of exploration have

proved to be really practicable. It cannot be denied, however, that the circuit described by the valley of the Fraser as far north as lat. $54^{\circ} 45'$ is immense, as compared with a straight line from the Cache to Quesnel-Mouth, both of them in the same latitude—220 miles against 120. So much so, that a shorter line was suggested by the writer as far back as June, 1867, which, though traversing a greater extent of mountainous country, would, if found to be practicable, alike open the Chilcoaten plain, and pass over a tract of agricultural country equal to that by the Fraser; at the same time that it would be more central as regards the southern portion of the colony. This line would follow Milton and Cheadle's track,* but only to a point some 20 or 25 miles below the Forks, where the Upper Thompson falls in from the N.E.; so as to cross the Bald or Gold Mountains, about lat. $52^{\circ} 10'$, 40 to 50 miles south of their point of greatest elevation, and, consequently, at a much lower altitude, and reach the Great Quesnelle, or, more probably, Horsefly Lake, beyond; whence the line would continue west to the "Gap," or entrance of the Bute Inlet valley.

Carrying out this idea, the distance from the summit of the Yellow Head Pass to opposite the Cache is 58 miles.

The road would then cross the Fraser, which is here very impetuous, to the Cache, situated in a valley about 5 miles wide at its base on the river, and running to a point 15 miles south. Part of this valley is rich and fit for settlement, but the southern end is sandy and undulating. The road would pass up it over easy ground, cross Cranberry river, a small tributary flowing north to the Fraser, then skirting a small lake, imperceptibly pass the watershed between the Fraser and the Columbia. The valley is divided here by a line of hills to the south, and forks into two narrow valleys. Taking the more westerly one, the road would follow it for a mile or so, leaving the mountains to the east, and reach Canoe river, a rapid stream flowing from the N.W. at the foot of a steep, sandy cliff. Distance

Crossing Canoe river, the road after running a mile or two S.W. would make a detour of a couple of miles to the west, in order to get round the point of a range of hills to the south; and passing among rocks and burnt timber enter a narrow valley to the west of them, drained by a small stream running north. This it would follow up, rising imperceptibly for 8 or 10 miles, to a little marshy lake, called Albreda Lake, occupying the bottom of the valley, and forming the watershed (2,900 feet above the sea) between Canoe river and the North Thompson. Following the stream from this lake, the road would continue south for about 18 miles along a valley closely shut in by steep, pine clad hills, with snowy limestone mountains in the rear, and over undulating hilly ground, requiring a certain amount of

Miles ... 58

* I am kindly indebted to these gentlemen for a portion of the following and some of the preceding details.

Over ... 75

grading; the timber becoming of very large growth, and the stream gradually increasing by the contribution of six or eight tributaries from the west (one of them rather a large one) to a width of 30 yards; till it joins the Upper Thompson, the first mouth of which (for there are two with an island between) is about 60 yards wide, flowing from the N.W., and charged with glacier water. Distance from Canoe river 32

The rise of ground between the latter and the Thompson is trifling, and so far the projected Short Cut presents no very serious obstacle. But at this point, the aspect of the elevated ridges to the west of the Thompson is such, as to preclude any reasonable hope of being able to carry a road in a straight line over them to the Clearwater, and again over the divide between the latter and Great Quesnelle Lake.

The road would therefore have to be continued further south, down the west bank of the Thompson, along steep, timber-strewn hill-sides; the forest as dense as ever, and the mountains coming down close to the water's edge, and only separated by narrow ravines from the N.E. and N.W.; till it reached the neighbourhood of Mount St. Anne, the last snow-capped mountain to the west, in about lat. $52^{\circ} 18'$, and 10 or 12 miles below the Forks. 12

Here the river widens and becomes less rapid; 3 or 4 miles lower down, where a rocky rapid stream falls in from the N.W., the valley also widens somewhat; 8 or 9 miles below Mount St. Anne another rapid stream, 40 yards wide, falls in from the N.W., the valley widens still more, and the country opens generally, though the hills again close in towards the south; and 3 or 4 miles further, or about 16 miles in all, a third stream falls in from the N.W., named the Elsecar, 30 yards wide, clear and shallow, and consequently not fed by snows or glacier water; showing that the region where it takes its rise (probably to the N.W. of Mount St. Anne) must be less elevated. The valley also presents a tolerably level space. It is, therefore, more than probable that a pass to the west may be found here, if not by the first stream immediately below Mount St. Anne, somewhere near the second; or at a distance from it, say of 12 miles 12

Thus far the road is known, and may be considered practicable, though the hill side cuttings and gradings along the Thompson and elsewhere would be numerous and expensive, as well as the bridges over the Fraser, Canoe river, and at the Forks. But the road now enters on an unknown region; crossing nearly due west for 22 miles over an elevated divide to the sources of the Elsecar, and then probably over lower ground to Clearwater river; the name itself indicating the absence of snowy mountains. Beyond this it would cross a third, and still easier divide, to the eastern end of Horsefly Lake, 18 or 20 miles further west, and about 2,100 feet above the sea. The road would ere this have left the mountains; the width across which from the Thompson would therefore not be more than 36 or 38 miles, and the total distance, sinuosities included, about

43

Miles ... 174

Over ... 174

The line would then run for 22 miles nearly due west along one side or other of the lake, and then follow the stream issuing from it, to its junction with the Horsefly river, near long. $121^{\circ} 30'$, lat. $52^{\circ} 25'$. Distance in all

35

The road now enters on a country sufficiently known, and partially settled. Continuing nearly due west, it would cross a slightly rolling, fertile tract of country, for about 25 miles, to the divide near Round Tent Lake, about 125 feet above the Horsefly; and then proceed, with a nearly equal fall in the course of the next 10 miles, to Deep Creek, which it would follow in a varying westerly direction, and with a fall of about 600 feet in 9 miles, to its junction with the Fraser, 1,450 feet above the sea. Total distance, sinuosities included,

47

The road would then cross the Fraser, and pass over the Chilcoaten plain in a W.S.W. direction, and with an ascent of about 900 feet, to the old Fort on the Chiscoe or Chilcoaten river. Distance

58

Thence it would run in the same direction, crossing the eastern or main branch of the Homathco, to the "Gap" or entrance of the Bute inlet valley, 2,520 feet above the sea.

47

Thence south, down the Bute Inlet valley to Waddington Harbour.

84

Distance by proposed Short Cut ... Miles 445

RECAPITULATION.

	Miles.
From Montreal to Ottawa	115
" Ottawa to Fort Garry	1200
" Fort Garry to the Yellow Head Pass	1010
Thence to the Limit of British Columbia	52
	<u>2262</u>
Route by the Upper Fraser (British Columbia) ..	570
Less distance by proposed Short Cut	125
	<u>445</u>
	<u>2707</u>
Total Length from Montreal to the Pacific	2822
Against 3,305 miles from New York to San Francisco, or 483 miles less.	

The distances given in my pamphlet are greater than these. In the first place, because no allowance was made for the proposed Short Cut in British Columbia, which in all probability can be realised; and, secondly, because they were only roughly calculated and rather exaggerated. The difference favours my estimate and renders it still more ample; making the average cost about £10,000 per mile; whereas that of 1,110 miles of

the Union Pacific Railroad, including a line of telegraph, preliminary surveys, rolling stock, and interest, has given an average of 34,977 dols., or only about £7,000, though the line presented greater difficulties than that through British North America.

The above distances may also be classed in three categories, as regards the nature of the soil and country traversed, viz. :—

1. Level, rich, arable country.
2. Rolling country, less fertile.
3. Poor, mountainous, and timbered.

SECTIONS OF COUNTRY.						1 Level	2 Rolling	3 Poor
						Miles.	Miles.	Miles.
Valley of the Ottawa	..	..	..	..	..	99	285	..
Montreal Valley	..	..	..	..	..	250	..	..
Clay Level Country	..	..	..	..	..	20	30	58
Lawrentides, North of Lake Superior	..	..	..	..	..	41	..	..
Neepigon and Black Sturgeon Valleys	..	..	..	..	..	118	..	247
Height of Land, to White Mouth River	..	..	..	..	..	1037	..	..
Great Western Plain	..	..	..	..	..	..	25	..
" " " approach to Rocky Mountains						..	30	..
Valley of the Assiniboine	..	..	..	..	..	..	..	80
Rocky Mountain, to the Cache	..	..	..	..	..	..	..	116
Bald or Gold Range beyond	..	..	..	..	..	..	20	15
Along Horsefly Lake and River	..	..	..	..	..	152	..	..
Chilcoaten Plain	..	..	..	..	..	..	..	84
Cascade Range (the Valley itself fertile)	..	..	..	..	..	1599	508	600

RECAPITULATION.

Rich and cultivable Territory	..	..	..	..	..	2107
Grazing, Timbered, and Mountainous	..	..	..	..	..	600
						2707

OF COST BASED UPON THE ABOVE CLASSIFICATION.

1600 Miles	Level Ground, ..	..	..	at £8,000	£12,800,000
508 "	Rolling Ground, ..	..	..	at £11,000	5,588,000
600 "	Hilly or Rocky Ground ..	..	..	at £14,000	8,400,000
13 "	Branch to Neepigon Bay,..	..	..	at £11,000	143,000
					£26,931,000
Interest for six years, till the road becomes self-paying					5,069,000
					£32,000,000

APPENDIX.

A.—CULMINATING POINTS ON THE LINE.

	Lat.	Long.	Alt.
North angle of Montreal river	48° ..	81° 10' ..	830
Height of Land between Lakes Superior and Winnipeg	49° 20' ..	90° 10' ..	1400
Leather or Yellow Head Pass	52° 54' ..	118° 33' ..	3760
Pass across the Bald or Gold Range	52° 10' ..	120° 10' ..	3000(?)
Summit of Chilcoaten plain	51° 47' ..	124° 30' ..	2520

B.—PRINCIPAL STREAMS AND RIVERS.

NAMES.	Very Small.	Small.	Mid- ding.	Large.
Madawaska at Arnprior			1	
Constant Creek on the Ottawa	1			
Bonnechere on the Ottawa			1	
Indian River on the Ottawa, above Pembroke ..		1		
Petowawa on the Ottawa			1	
Creek near Chalk Lake		1		
Mattawan			1	
Tributaries of the Ottawa	1	2		
Tributary of Montreal river		1		
Montreal river at North Bend			1	
Waratowaha or South Branch of Abbitibi ..			1	
South Branch of Moose river			1	
Moose river			1	
Head of White or Pike river (?)		1		
East Branch of Pie river		1		
Pie river			1	
Little Pie river		1		
Little Pie, Western affluent		1		
Small stream, no name	1			
Steel river		1		
Long Lake (Albany)		1		
Affluent of Trout Lake	1			
„ Black river	1			
Black river		1		
Pays Plat river		1		
Gravel river	1			
Cypress river	1			
Jack Fish river		1		
NEEPIGON				1
Black Sturgeon			1	
Little Black Sturgeon		1		
West feeder to Neepigon Lake		1		
Small streams	2			
Canoe river			1	
White Fish river		1		
North affluent of White Fish Bay		1		
WINIPEG (as big as the Rhine)				1
Labarriere			1	
East Branch of White Mouth			1	
	9	18	13	2

NAMES.					Very Small.	Small.	Mid- dling.	Large.
Over					9	18	13	2
White Mouth	..	..	..	..		1		
Broken Head, East Branch ..	..	..	..	..			1	
" other branches ..	..	..	..	..		2		
German Creek	..	..	..	..	1			
RED RIVER (150 yards) ..	..	..	..	..				1
Sturgeon Creek	..	..	..	..		1		
Tributary of the Assiniboine ..	..	..	..	..	1			
Creek at Long Lake	..	..	..	..	1			
Rat river	..	..	..	..		1		
Tributary to White Mud river ..	..	..	..	..		1		
White Mud river	..	..	..	..			1	
Streams from Riding Mountains ..	..	..	..	..	3			
Rapid river	..	..	..	..			1	
Tributary to Rapid river ..	..	..	..	..		1		
Oak river	..	..	..	..		1		
Branches of Arrow river ..	..	..	..	..	2			
Head of Pine Creek	..	..	..	..	1			
" Bird Tail Creek	..	..	..	..	1			
Stream without a name	..	..	..	..	1			
Shell river	..	..	..	..			1	
Tributary of Assiniboine	..	..	..	..			1	
ASSINIBOINE (80 yards) ..	..	..	..	..				1
Tributary to Calling river ..	..	..	..	..	1			
Little White Sand River ..	..	..	..	..		1		
Tributaries to Last Mountain Lake ..	..	..	..	..		2		
SOUTH SASKATCHEWAN (180 yards)	..	..	..	..				1
Eagle Hill Creek	..	..	..	..			1	
Ear Hill Creek	..	..	..	..		1		
Creek at Head of Chain of Lakes ..	..	..	..	..	1			
Eye Hill Creek	..	..	..	..		1		
Nose Creek	..	..	..	..			1	
BATTLE RIVER	..	..	..	..				1
Long Lake Creek	..	..	..	..		1		
Smoking Wood Creek	..	..	..	..	1			
Pigeon Lake Creek	..	..	..	..	1			
Bull Lake Creek	..	..	..	..	1			
NORTH SASKATCHEWAN	..	..	..	..				1
Pembina	..	..	..	..			1	
M'Leod	..	..	..	..			1	
Affluent of Athabasca (3 mouths)	..	..	..	..		3		
Creek from small lake	..	..	..	..	1			
ATHABASCA (200 yards) ..	..	..	..	..				1
Miette (30 yards) twice (?) ..	..	..	..	..		2		
Pipestone	..	..	..	..		1		
Moose river	..	..	..	..			1	
Grand Fork (5 mouths) ..	..	..	..	..		5		
Tributaries to Fraser	..	..	..	..	3	1		
UPPER FRASER	..	..	..	..				1
Cranberry	..	..	..	..		1		
Canoe river	..	..	..	..			1	
Stream from Alabreda Lake ..	..	..	..	..		1		
Tributaries to	..	..	..	..	5	1		
North Thompson (one branch 60 yards)	..	..	..	..				1
Tributaries to North Thompson ..	..	..	..	..		2		
Head of Elsecar river	..	..	..	..		1		
Clearwater	..	..	..	..			1	
					34	50	25	10

NAMES.	Very Small.	Small.	Mid-dling.	Large.
Over	34	50	25	10
Horsefly			1	
Streams near Round Tent Lake	2			
FRASER (200 yards)				1
Chilcoaten or Chiscoe			1	
Upper Homathco		1		
River above 4th Lake, Butte Inlet Valley	1			
" below 3rd		1		
" above 2nd		1		
" below 2nd		1		
" the Cliff (3 times)		3		
Stream from Upper Glacier		1		
River at opening of valley (twice)			2	
Lake Creek		1		
River above Tiedemann's Glacier (twice)			2	
Stream from			1	
Creek below third Bluff	1			
Brown Creek	1			
HOMATHCO at Ferry (70 yards)				1
Rock Creek		1		
Creek at Wig Camp	1			
" above Happy Valley	1			
" below	1			
Lower Glacier Stream		1		
Branches of	6			
Stream lower down	1			
Creek above Henrietta's Landing	1			
Teaquahan	1			
	51	61	32	12

Total number 156, but the list of smaller streams is necessarily incomplete.

C.

The following table containing the main features of the line traversed by the Central Pacific Railroad, shows the great disadvantages it labours under with respect to grades, altitudes, climate and general sterility, as contrasted with the proposed line through British North America.

LOCALITIES.	COUNTRY TRAVERSED.				Height above the sea.	Rise or Fall.	GRADIENTS.	
	Culti-vable.	Grazing	Barren Desert.	Total.			Feet per Mile.	One in
	Miles.	Miles.	Miles.	Miles.	Feet.	Feet.		
Omaha, on the Missouri					967			
" to Julesburg, Platte Valley	150	100	127	377				
Julesburg, by Lodge Pole Creek, to Cheyenne	..	10	130	140	6062	R. 5095	10	528.0
Cheyenne to Evans Pass, Black Hills	..	32	..	32	8262	R. 2200	71	74.3
Laramie Plains (oats will not ripen) to Bridger's Pass	..	189	..	189	7100	F. 1162		
	150	331	257	738				

LOCALITIES.	COUNTRY TRAVERSED.				Height above the sea.	Rise or Fall.	GRADIENTS.	
	Culti- vable.	Grazing	Barren Desert.	Total.			Feet per Mile.	One in
	Miles.	Miles.	Miles.	Miles.				
Over	150	331	257	738				
Thence to foot of Wahsatch Mountains (a most deso- late region)	..	..	200	200				
Thence to the dividing ridge	..	..	20	20	7567			
Thence to the western foot and beginning of Great Desert	..	40	..	40	4960	F. 2607	65	81.2
Thence to Great Salt Lake	..	..	70	70	4290	F. 670	10	528.0
Thence to divide from basin of the Humboldt	..	..	..	..	5650	R. 1360		
Thence to Truckee river, limit of the Great Desert	..	..	577	577	5866			
Thence to Donner Pass, summit of Sierra Nevada	..	14	..	14	7042	R. 1176	84	62.8
Thence down to Colfax	..	51	..	51	2448	F. 4594	30	58.6
Colfax to Sacramento	54	..	..	54	56	F. 2392	44	121.7
Sacramento to San Fran- cisco	85	..	..	85	..	F. 56		
	289	436	1124	1849				

Of these 1,849 miles, 300 in the Rocky Mountains are subject to be snowed in for weeks in the year; 30 miles in the Sierra Nevada have had to be protected from avalanches by strong timber roofing; and more than 1,100 traverse barren tracts of country, infested with alkali, incapable of irrigation, and in many places desolate beyond description. Finally, the rise from Sacramento to the summit ridge of the Sierra Nevada amounts to 7,000 feet in 105 miles, whilst on the eastern slope there is a descent of 1,200 feet in 14 miles, occasioning grades of one in 48½, and requiring the most powerful engines to drag a relatively small amount of traffic.

D.—EXTRACT FROM THE REPORT OF THE SENATE COMMITTEE
ON PACIFIC RAILROADS, *Dated February 19th, 1869.*

"The line of the North Pacific road runs for 1,500 miles near the British possessions, and when built, will drain the agricultural products of the rich Saskatchewan and Red River districts east of the mountains, and the gold country on the Fraser, Thompson, and Kootenay rivers west of the mountains. From China (Canton) to Liverpool, it is 1,500 miles nearer by the 49th parallel of latitude, than by the way of San Francisco and New York. This advantage in securing the overland trade from Asia will not be thrown away by the English, unless it is taken away by our first building the North Pacific road, establishing mercantile agencies at Puget Sound, fixing mercantile capital there, and getting possession on land and on the ocean of all the machinery of the new commerce between Asia and Europe. The opening by us first of a North Pacific Railroad seals the destiny of the British possessions west of the 91st meridian. They will become so Americanised in interests and feeling, that they will be in effect severed from the new Dominion, and the question of their annexation will be but a question of time."

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